The Willamette River averaged 0.3 foot above normal. The highest stage at Portland was 16.6 feet on the 1st, and the lowest was 7.4 feet on the 31st. The highest water at Salem was 3.1 feet on the 2d, and the lowest was 0.7 on the 31st.

The Columbia River averaged 3.3 feet below its monthly normal. The greatest departure in its lower course was 5.1 feet below normal at The Dalles and Cascade Locks, and for its upper course 5.4 feet below normal at Northport, Wash. The highest stage at Vancouver was 17 feet on the 1st and at Wenatchee 31.1 feet on the 2d. The lowest water at Vancouver was 7.5 feet on the 31st and at Wenatchee 19 feet on the same date. The highest and lowest stages at Northport, Wash., were 21.3 feet and 9.3 feet on the 1st and 31st, respectively.

The Snake River averaged slightly above normal, and it was 5.5 feet to 8.6 feet lower than in June. The highest stage at Lewiston was 10 feet on the 1st, and the lowest stage 2.7 on the 31st. Navigation was suspended on the lower Snake shortly after the middle of the month on account of the low stages in the river.

RECONNOISSANCE OF THE DESCHUTES RIVER IN JULY, 1912.

By JOHN H. LEWIS, State Engineer and Secretary of the State Land Board.

That there is some truth in the statement that the Deschutes River is the most wonderful stream in the world is the opinion derived from a 10-days' trip covering its entire drainage basin.

Building is active in most of the Crook County towns, and many acres are now being cleared and put into crops for the first time. Perhaps the greatest area cleared this season is along Squaw Creek, near Sisters, as a result of the recent adjudication of water rights by the board of control. Those having incomplete rights must put the water to use this fall or it will revert to the new appropriators, who are eagerly awaiting the chance of using the water. The recent rain has given to the dry-farming sections a prosperous look, and the building of the North Canal diversion insures the irrigated section near Bend a reliable water supply.

This present development is nothing when compared with the possibilities for future development.

The Deschutes River at Benham Falls has a mean annual discharge of 1,220,000 acre-feet of water, as shown by eight years' records. The minimum year furnished 1,070,000 acre-feet, so that it is safe to say that there is available at this point for irrigation purposes 1,000,000 acre-feet of water. This will irrigate 333,000 acres of land, or a strip 1 mile wide and 520 miles long.

The regular flow will ultimately irrigate about 120,000 acres between Bend and Crooked River. Every drop of the remaining water can and should be stored for irrigation purposes through the construction of a 60-foot dam at Benham Falls. This could be released in the summer and diverted near Cline Falls for the irrigation of 110,000 acres on Agency Plain, for the irrigation of 50,000 to 100,000 acres on the west side of the Deschutes River and north of Laidlaw and, by diverting above Bend, 50,000 acres could be irrigated in the Benham Falls segregation just south of Prineville. There are no great engineering difficulties to be overcome in the construction of this project, and it appears that it is one of the cheapest in the State to construct.

The entire flow near the head of the river can be used for the irrigation of about 60,000 acres above the Benham Falls reservoir without materially affecting the above figures, as the seepage would be collected in the reservoir below.

Between Benham Falls and Cline Falls there is 1,300 feet fall. About 60 per cent of the 1,000,000 acre-feet of water would be discharged through the dam for irrigation purposes during July and August, and would be available for the development of power, which can be transmitted economically two to four hundred miles for the pumping of water to irrigate other lands, say along the Columbia River. This water at a 100-foot drop immediately below the dam would furnish 56,800 horsepower, which at 50 per cent of plant efficiency will lift 2,500 second-feet 100 feet above the Columbia River for the irrigation of 200,000 acres of land. There is another fall of 100 feet a short distance below and above the first diversion for irrigation, and the amount of summer power which can be developed in the 1,300 feet fall to the last diversion at Cline Falls is almost inconceivable.

For the greatest good to the greatest number the Deschutes River between Cline Falls and the junction with Crooked River should be dried up except for seepage water. Below this point the river is of most value for power, and the total possible diversions for irrigation outlined above, without considering return seepage, will not seriously affect its value for such purpose, but, with return seepage, may improve the power value of the lower river.

Sixteen dam sites have been located in the narrow rock-walled canyon from the Columbia River to just below the junction of the Metolius with the Deschutes River. With 4,000 second-feet at the 1,300 feet of fall which can be developed at these sites 600,000 theoretical horsepower can be generated. With the low and high year flow equalized at the Benham Falls reservoir and with a 120-foot dam in the Crooked River about 40 miles above Prineville, this low water flow can be increased to about 6,000 second-feet and the power to nearly 900,000 horsepower. This is about six times the present installed steam and hydroelectric machine capacity in the vicinity of Portland and about 40 times the low-water power development at Oregon City. Besides this, an enormous quantity of power can be developed on the Metolius River and at other points.

These possibilities could be greatly complicated by development at the wrong time and place, and if carried out under our present wasteful system of competition the expense to the public will be greatly increased through lack of harmony between plants.

The above information, though preliminary, has been gathered by the State and the U. S. Geological Survey acting in cooperation. A complete report will be available early next year. This stream affords a striking example where to secure the highest, most logical, and orderly development; the entire stream should be turned over to one corporation subject to regulation, or else developed by the public as the need arises. To promote the immediate and best use of this stream is one of the problems which should receive careful consideration at the hands of the State legislature.